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- (21) Application No. 59250/70 (22) Filed 14 Dec. 1970  
 (23) Complete Specification filed 25 Nov. 1971  
 (44) Complete Specification published 20 Nov. 1974  
 (51) International Classification A47L 11/33  
 (52) Index at acceptance  
     A4F 7  
     A4K 2A7A 2B7 2C2D 2C2X 2CX  
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## (54) CARPET SWEEPERS

(71) We, THE PRESTIGE GROUP LIMITED, a British Company of Prestige House, 14-18 Holborn, London E.C.1. do hereby declare the invention for which we pray that a Patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to a carpet sweeper having a casing within which is a brush which can rotate about a substantially horizontal axis.

Conventional carpet sweepers have difficulty in sweeping close to corners and walls due to the casing of the sweeper extending beyond the axial end of the sweeper brush. This commonly occurs due to the sweeper brush having bearings at its ends which must be accommodated within the casing and due to the sweeper elements of the brush, which may be in the form of tufts, extending radially outwardly at right angles to the hub on which they are mounted. It has been suggested to provide additional brushes adjacent the side edges of a sweeper which are mounted to rotate about a vertical axis but such arrangements require additional drive means and are complicated and expensive to produce.

According to the present invention a carpet sweeper has a casing located within which is a brush which can rotate about a substantially horizontal axis and which comprises a hub carrying a number of radially outwardly extending sweeper elements, one or more of said elements being located on said hub so that they are oblique to the axis of rotation of the brush and projects axially beyond the end of the hub and beyond an adjacent wall of the casing.

Thus a brush of the kind set forth will act to sweep into corners of walls.

Such oblique sweeper elements can be provided at one or both ends of the brush.

[Price 25p]

preferably at both ends so that both sides of the sweeper can be utilised for corner cleaning.

Preferably a number of oblique sweeper elements are provided at each end of the brush in order to provide a substantially constant sweeping action as the brush is rotated.

In a preferred construction the oblique sweeper element or elements projects radially beyond the other sweeper elements.

Preferably the sweeper elements are in any case in the form of tufts made from bristles or fibres which may be of a synthetic material if desired and when the oblique end tufts are longer than the others, as mentioned above, a circular sweeping action is achieved by each tuft as it is deflected by the surface over which it is being moved which acts to flick dust and debris towards the centre of the brush where it can be dealt with by the conventional radially extending sweeper elements. This circular sweeping action is due to each long tuft first being deflected backwards by the surface against which the brush is rotating. The backwards action is maintained until the tuft passes a certain angular position in relation to the surface, the tuft then flicking forwards and inwardly due to the continued rotation of the brush so that debris engaged by the tuft is thrown forwards and axially inwardly where it can be engaged by the other sweeper elements.

If desired two or more circumferentially extending rings of oblique tufts can be provided and they may be of different diameters.

In a preferred embodiment the sweeper elements are arranged in axially extending helical rows with oblique elements arranged at the ends of each row.

In a convenient construction the hub of

the brush carries a drive wheel at a point intermediate its ends and in a preferred embodiment the hub carries two drive wheels each of which is spaced away from the centre of the axial length of the hub and also spaced away from an adjacent end.

The invention may be performed in many ways and a number of embodiments will now be described by way of example and with reference to the accompanying drawings in which:—

Figure 1 is a side elevation of a carpet sweeper according to the invention, and

Figures 2 to 6 are part plan views showing the action of the brush when in use, and

Figures 7 to 9 are part side elevations of alternative constructions.

In the arrangement to be described and as shown in Figure 1 a carpet sweeper according to the invention has a brush which can rotate about a substantially horizontal axis and which comprises a wooden hub 1 in which are mounted in known fashion a number of rows of sweeper elements which are in the form of tufts 2. The hub is shaped to provide two axially spaced drive wheels 3 which are spaced away from the centre of the axial length of the hub and also spaced away from the adjacent ends 4. Each of the sweeper elements formed by the tufts 2, which may be made from bristles or fibres, projects radially outwardly but the tufts 5 which are the end tuft in each row are oblique to the axis of rotation of the brush so that they also project axially beyond the adjacent end 4 of the hub 1. Each of the tufts 5 is also of greater length than the remaining tufts so that as it engages the surface to be swept, indicated by reference numeral 6 it is deformed as is shown in Figure 1. The outer casing of the carpet sweeper is indicated by reference numeral 7 and it will be seen that the tufts 5, due to the deformation extend beyond the adjacent wall 7a of the casing thus enabling the tufts 5 to sweep dust and debris beyond the casing for example in corners of walls. In an alternative arrangement, not shown, the casing could be shaped so that the end of the brush projected beyond it or the casing could be arranged close to the end of the brush so that the tufts were also deformed when they were within the casing, but projecting outwardly beneath the casing as they passed below it. The same effect could also be achieved with tufts 5 which were of the same length as tufts 2. In this case, however, the circular sweeping action which is now to be described would not be achieved.

Figures 2 to 6 indicate the circular sweeping action which is achieved by the

long oblique tufts, 5. In Figure 2 the general direction of movement of the brush along the floor, due to the forward motion of the sweeper and also the rotary motion of the brush is indicated by arrow 10. In order to clarify the drawing only one tuft 5 is shown. In the position shown in Figure 2 the tuft 5 is approaching the floor surface which is beneath it. In Figure 3 contact has been made with the floor surface and arrow 11 indicates the backward movement of the tuft 5 as it engages the surface beneath it. This backward bending of the tuft 5 continues as the brush rotates to the position indicated in Figure 4 but further rotation of movement allows the tuft 5 to flick forward as indicated in Figure 5, the forward and axially inward movement of any dust or debris on the bristle being indicated by arrow 12. Figure 6 shows the tuft 5 as it again straightens out and starts to rise due to the rotary movement of the brush. It will be appreciated that the movement of the brush against the floor is semicircular so that a part circular sweeping action is achieved, which sweeps dust and debris towards the main bristles 5 which will sweep the matter into the dustpan of the sweeper.

It has been found that tufts 5 which are the same length as the tufts 2 are capable of sweeping into corners but even better results are achieved if the oblique tufts 5 are longer than the remaining tufts 2 and provide the circular sweeping action referred to above.

In the arrangement shown in Figure 7 the end of the hub 1 is provided with three circumferentially extending rings of oblique tufts 5. In this arrangement only the first ring of tufts indicated by reference numeral 13 extend axially beyond the end of the hub 1, and beyond the casing 7. The tufts 13 are slightly longer than the tufts 14, 15 but the tufts of all three rings are of greater length than the remaining tufts (not shown) on the centre portion of the hub 1 so that the circular sweeping action is achieved.

In the arrangement shown in Figure 8 the diameter of the inclined tufts 16, 17, 18 on the end of the hub are gradually tapered but due to their length and oblique mounting they again produce the required circular sweeping action.

In the arrangement shown in Figure 1 a three part dustpan is required for dust collection but a single pan can be used if only a short section of oblique tufts are used at each end of the brush, the tufts running inside a specially shaped end wall of the main casing. Thus the dust can be swept towards the centre of the sweeper and then picked up by the main section of the brush. Such an arrangement is shown in

Figure 9 in which the hub 1 has a driving wheel 3 and the end portion of the hub 1 is tapered as illustrated at 22 to provide a mounting for two rings of oblique tufts 23, 24. The tufts 23 are of slightly greater length than the tufts 24 to provide a "taper" effect and the tufts 23 extend axially beyond the end of the hub 1. Two further rows of oblique tufts 25, 26 are provided on the main body portion of the hub 1 together with rings of shorter length tufts 27. Again the tufts 25, 26 are of different lengths to provide a "taper" effect and they are of substantially the same outer diameters as the tufts 23, 24. The sweeper casing is provided with a shaped end wall 28 in which the hub 1 is carried on a bearing 29 and due to the angle of the tufts 23, 24 and 25, 26 the dust is swept towards the centre of the sweeper where it is picked up by the tufts 27. Due to the small axial length of the portion 22 of the hub 1 only a single section dustpan is necessary.

The taper end portion 22 of the hub 1 allows the length of the tufts 23, 24 to be increased in relation to the tufts 25, 26, 27 carried on the main portion of the hub 1 so that the effect of these tufts is that they are softer thus assisting in deformation for a given overall diameter.

In the arrangements described above straight rows of tufts are provided but if desired the sweeper elements could be arranged in helical rows.

Again, the tufts 5 could be replaced by other sweeper elements such as those made from felt, sponge, rubber, or other materials and the invention is not limited to the use of bristle or fibre tufts although these are usually the most convenient form of sweeper elements.

The sweeper brush can also be driven in various ways, for example by driving wheels or support wheels or by means of a band.

The bearings for the brush can also be on the centre portion of it and oblique tufts can be provided to project past the bearings and sweep the area beneath them.

#### WHAT WE CLAIM IS:—

1. A carpet sweeper having a casing located within which is a brush which can rotate about a substantially horizontal axis and which comprises a hub carrying a number of radially outwardly extending sweeper elements, one or more of said elements being located on said hub so that they are oblique to the axis of rotation of

the brush and project axially beyond the end of the hub and beyond an adjacent wall of the casing.

2. A carpet sweeper as claimed in Claim 1 in which oblique sweeper elements are provided at both ends of the hub.

3. A carpet sweeper as claimed in Claim 2 in which a number of oblique sweeper elements are provided at each end of the hub.

4. A carpet sweeper as claimed in any one of Claims 1, 2 or 3 in which the oblique sweeper element or elements projects radially outwardly beyond the other sweeper elements.

5. A carpet sweeper as claimed in any one of Claims 1-4 in which the sweeper elements are tufts made from bristles or fibres.

6. A carpet sweeper as claimed in any one of claims 1-5 in which two or more circumferentially extending rings of oblique tufts are provided.

7. A carpet sweeper as claimed in Claim 6 in which the rings of oblique tufts are of different diameters.

8. A carpet sweeper as claimed in any one of Claims 1-7 in which the sweeper elements are arranged in axially extending helical rows with oblique elements arranged at the ends of each row.

9. A carpet sweeper as claimed in any one of Claims 1-8 in which the hub of the brush carries a drive wheel at a point intermediate its ends.

10. A carpet sweeper as claimed in Claim 9 in which the hub of the brush carries two drive wheels each of which is spaced away from the centre of the axial length of the hub and also spaced away from an adjacent end.

11. A carpet sweeper as claimed in any one of the preceding claims in which the brush is carried in bearings located in its centre portion, and oblique sweeper elements are provided on the brush to project past the bearings and sweep the area beneath them.

12. A carpet sweeper substantially as described herein with reference to and as shown in Figures 1 to 5, and Figures 7, 8 and 9 of the accompanying drawings.

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FIG. 1.

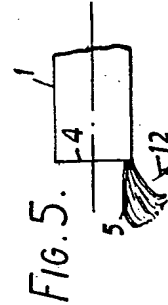
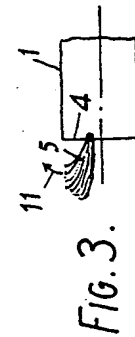
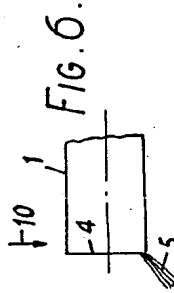
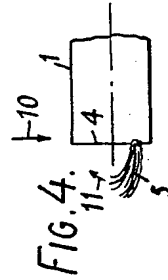
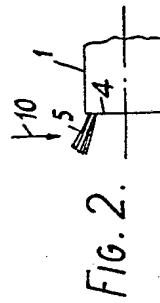
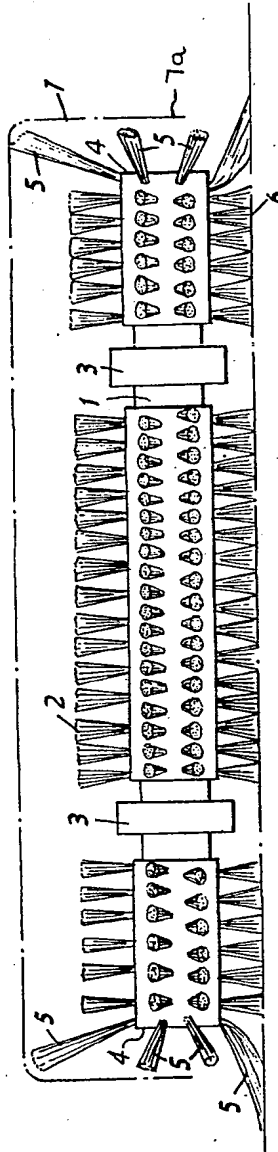


FIG. 7.

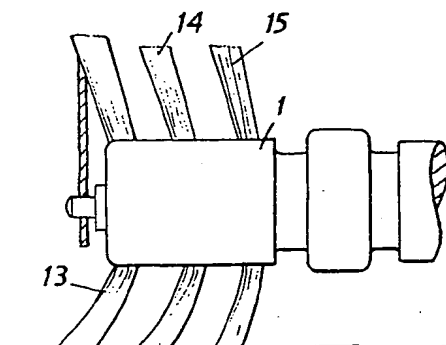


FIG. 8

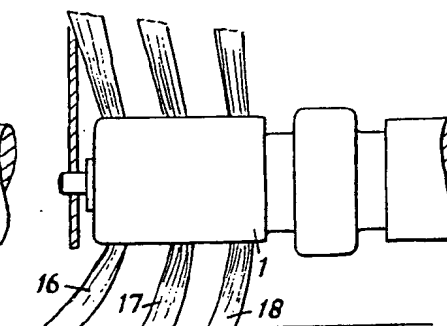


FIG. 9.

